I submit a few negatives as samples of the general character of those already taken. Amongst them are plates of *Polaris*—*Andromeda* with the *Nova*—the *Pleiades* and *Nebula* in *Orion*.

On the Orbit of γ Coronæ Australis. By J. E. Gore.

The duplicity of this interesting binary star was discovered by Sir John Herschel at the Cape of Good Hope. Elements of the orbit were published by Captain Jacob in the year 1855 (*Monthly Notices*, R.A.S., vol. xv. p. 208), and he found a period of 100·80 years, with periastron passage, 1863·08. Some years since Prof. Schiaparelli published elements in No. 2,073 of the *Astronomische Nachrichten*, in which he assigns a period of 55·582 years, with an eccentricity of 0·6989, and periastron passage 1882·774. These elements were corrected by Mr. Downing (*Monthly Notices*, May 1883). As there are considerable differences between the elements found by Captain Jacob and Prof. Schiaparelli, particularly in the length of the period, I determined to make a new computation of the elements, and details of the results I have arrived at may be of interest.

The orbit was computed by a graphical method, in which the dimensions and position of the real ellipse are derived from those of the apparent ellipse by means of Thiele's harmonic ellipse. This latter ellipse being the orthogonal projection of the harmonic circle on a plane perpendicular to the line of sight, its major axis is of course equal in magnitude to the *latus rectum* of the real ellipse, and its angle of eccentricity is the angle of inclination of the plane of the real ellipse to the plane of projection on the background of the heavens. Thus the magnitude and position of the real orbit can be fully determined.

The following are the observations from which I have computed the elements. They have been corrected for precession, by the usual formula, to the epoch 1880·0:—

γ Coronæ Australis.

Angles and Distances: Angles reduced to 1880.

R.A. 1880, $18^h\ 59^m = 284°\ 45'$.

Dec. S. 37° 18′.

Correction $= 0°·0055 \sin \alpha \sec \delta = -0°·007$ per annum.

t	θ'	θ	r	Observer.
	°	°	″	
1834·47	37·1	36·78	2·66	Sir John Herschel.
1835·55	36·8	36·5	2·66	,, ,,
1836·43	34·5	34·2	2·66	,, ,,
1837·43	32·7	32·4	2·66	,, ,,
1858·203	343·42	343·27	1·53	Jacob.
1863·836	318·1	318·0	1·25	Powell.
1875·65	257·4	257·37	1·45	Schiaparelli.

t	θ'	θ	r	Observer.
1876·6	253°·1	253°·1	1″·67	O. Stone.
1878·49	242·6	242·6	1·36	„
1879·69	240·0	240·0	0·87	Burnham.
1880·4	233·1	233·1	1·15	Russell.
1880·7	232·4	232·4	1·32	„

A table of interpolated angles and epochs was then formed, and the apparent ellipse drawn by the method described in the *Handbook of Double Stars*, by Messrs. Crossley, Gledhill, and Wilson. The elements of the real ellipse were then derived from the apparent ellipse, as above described. The elements thus found are as follows :—

Elements of γ Coronæ Australis.

Position of node	$\Omega = 45° 25'$
Inclination	$\gamma = 47° 26'$
Position of periastron	$\lambda = 141° 0'$
Eccentricity	$e = 0·322$
Period in years	$P = 81·78$
Periastron passage A.D.	$T = 1886·53$
Semi axis major	$a = 1''·885.$
Mean annual motion	$\mu = -4°·402$

These elements are of course only provisional, and further observations during the next ten years will be required before an accurate computation of the orbit can be made.

The shape of the apparent orbit and the elements found above somewhat resemble those of 70 *Ophiuchi*.

A comparison was made between the positions computed from the graphical construction for the epochs of observation, and the observed measures, with the following results :—

Epoch	Position Angles. Observed.	Position Angles. Computed.	Difference. O−C.	Distances. Observed.	Distances. Computed.	Difference O−C.
1834·47	36°·8	37°·6	−0·80	2″·66	2′·33	+0″·33
1835·55	36·5	35·6	+0·90	2·66	2·33	+0·33
1836·43	34·2	33·8	+0·40	2·66	2·34	+0·32
1837·43	32·4	31·8	+0 60	2·66	2·34	+0·32
1858·20	343·27	342·65	+0·62	1·53	1·66	−0·13
1863·83	318·0	321·3	−3·30	1·25	1·47	−0·22
1875·65	257·4	259·0	−1·60	1·45	1·39	−0·06
1876·60	253·1	253·6	−0·50	1·67	1·39	−0·28
1878·49	242·6	243·7	−1·10	1·36	1·40	−0·04
1879·69	240·0	238·0	+2·0	0·87	1·39	−0·52
1880·40	233·1	234·4	−1·3	1·15	1·37	−0·22
1880·70	232·4	233·9	−1·5	1·32	1·37	−0·05

The computed angles have been corrected for the effect of precession.

It will be seen that there is a fair agreement in the angles but not in the distances. In one of Sir J. Herschel's measures at the Cape, and to which he assigns greater weight than the others, he gives the distance as $2''{\cdot}40$, agreeing fairly with the computed distance at that epoch.

It may be mentioned that as the major axis of the orbit is not far from the line of nodes, we see it nearly of its natural length, as in the case of the binary η *Coronæ Borealis.*

For the calculation of an ephemeris, the following formulæ are derived from the elements:—

$$(1) \quad u - 18^\circ{\cdot}45 \sin u = -4^\circ{\cdot}402{\cdot}(t - 1886{\cdot}53).$$

$$(2) \quad \tan \tfrac{1}{2}v = 1{\cdot}396 \tan \tfrac{1}{2}u.$$

$$(3) \quad \tan (\theta - 45^\circ\ 25') = 0{\cdot}6764 \tan (v + 141^\circ\ 0').$$

$$(4) \quad \rho = 1''{\cdot}885\,(1 - 0{\cdot}322 \cos u) \,.\, \frac{\cos (v + 141^\circ\ 0')}{\cos (\theta - 45^\circ\ 25')}\,.$$

Where u is the eccentric anomaly, and v the true anomaly for the time t, θ the required position angle, and ρ the distance.

From these formulæ I have computed the following short ephemeris.

Date.	Position Angle.	Distance.	Date.	Position Angle.	Distance
	°	″		°	″
1886·0	200·7	1·20	1891·0	154·9	0·94
1886·53	196·7	1·13	1892·0	141·5	0·94
1887·0	193·0	1·08	1893·0	130·4	0·96
1888·0	184·3	1·04	1894·0	120·2	1·01
1889·0	174·7	0·99	1895·0	110·9	1·07
1890·0	164·9	0·96	1896·0	102·7	1·14

I may add that the above calculations were completed before I read Mr. Downing's paper. I find that the additional observations given by him all lie close to my interpolating curve, so that my results would not have been much altered had these additional observations been included.

On a new Variable Star of Short Period. By J. E. Gore.

I have lately discovered that the star 10 (Flamsteed) *Sagittæ* is an interesting variable of short period. I first suspected variation in this star in October 1879, when I found it fainter than 11 *Sagittæ*, although it was rated one-third magnitude brighter by Heis. I did not pay much further attention to the star until October 1885, when I again began to observe it, and a few consecutive fine nights in November showed that the star was certainly variable, with a period of 8–9 days. My observations have been fully confirmed by the Rev. T. E. Espin and Mr. E. F. Sawyer. The variation is approximately from 5·6 mag. to 6·4 mag. in the scale of the *Durchmusterung*, and the period about $8\frac{1}{2}$ days.

The following are all my observations to end of December 1885.

The comparison stars are:—

	Mag.	
11 Sagittæ	5·8	In *Durchmusterung*.
9 Sagittæ	6·6	
DM. + 16°, 4086	7·0	

Observations of 10 *Sagittæ.*

			h m	Mag.
1876	Dec.	14		5·6
1879	Oct.	7		6·3
1882	Nov.	2		6·0
1884	Sept.	21		6·4
1885	Oct.	15		6·0
		31		5·7
	Nov.	4	11 0	6·0
		9		5·7
		14	8 22	6·4
		14	10 55	6·4
		15	6 15	6·3
		15	10 15	6·3
		16	6 0	6·0
		16	10 35	5·9
		17	6 0	5·7
		18	6 10	5·8
		18	9 40	5·8
		21	5 53	6·1